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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/757,906	01/10/2001	Johnny Shepherd	1280.00281	8286

7590 03/15/2004

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EXAMINER

NGUYEN, DAVID Q

ART UNIT	PAPER NUMBER
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2681

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No:

09/757,906

Applicant(s)

JOHNNY SHEPHERD,
HILLSBOROUGH, NC;

Examiner

David Q Nguyen

Art Unit

2681

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, line 3, --said sample—has no antecedent basis.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greene, Sr. et al. (US Patent Number 5926763) in view of Mimura (US Patent Number 6587445).

Regarding claim 1, Greene discloses a method of controlling frequency use in a virtual single cell wireless communication network having a plurality of radio heads, comprising: authorizing all of said radio heads to selectively use all frequencies in a spectrum (see col. 1, lines 42-46); communicating between one radio head and a mobile terminal using one of said frequencies (see col. ²31-36); determining which of said radio heads will unacceptably interfere with each radio head (see col. 1, lines 24-40; col. 2, 31-36); denying use of a selected frequency

Art Unit: 2681

by one radio head whenever said selected frequency is being used by one of said radio heads which were determined to unacceptably interfere with said one radio head (see col. 1, lines 24-40; col. 2, 31-36); and determining whether said communication with said mobile terminal should be handed off to another radio head (see col. 9, lines 20-32). Green et al. are silent to disclose wherein said handoff is a soft handoff if said other radio head is not denied use of said one frequency, or a hard handoff if said other radio head is denied use of said one frequency. However, Mimura discloses determining whether soft handoff or hard handoff for the mobile station (see col. 9, lines 60-64). ^{It is known} ~~As we know~~ that in a cellular radio system a soft handoff is a handoff of mobile station between a base station to another base station using the same frequency, and hard handoff is a handoff of mobile station between a base station to another base station using a different frequency. It is apparent that a step of denying use of same frequency of Greene combined with the step of determining whether soft handoff or hard handoff for the mobile station of Mimura discloses a handoff is a soft handoff if said other radio head is not denied use of said one frequency, or a hard handoff if said other radio head is denied use of said one frequency. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Mimura to Greene in order to improve signal quality.

Regarding claim 2, a method of Greene in view of Mimura also discloses wherein said other radio head is not denied use of said one frequency based on use of said one frequency by said one radio head which terminates as a result of handing off said mobile terminal (see col. 1, line 24 to col. 2, line 53 of Greene).

Art Unit: 2681

Regarding claim 3, a method of Greene in view of Mimura also discloses comprising determining which of said radio heads have unacceptable interference with said mobile terminal, and denying use of said one frequency by said other radio head if still another radio head using said one frequency is determined to have unacceptable interference with said mobile terminal (see col. 2, lines 30-35 of Greene).

Regarding claim 4, a method of Greene in view of Mimura also discloses wherein said determining which of said radio heads will have unacceptable interference with said mobile terminal comprises continuously measuring said power of said mobile terminal signal at said other radio heads (see col. 5, lines 1-12 of Greene).

Regarding claim 5, a method of Greene in view of Mimura also discloses wherein determining which of said radio heads will unacceptably interfere with each radio head comprises determining attenuation between radio heads based on said geography of said network and layout of said radio heads (see col. 1, line 24 to col. 2, line 53 of Greene).

Regarding claim 6, a method of Greene in view of Mimura also discloses wherein said determining which of said radio heads will unacceptably interfere with each radio head comprises measuring attenuation between said radio heads and determining whether signals with each radio head will unacceptably interfere with other radio heads when subjected to said determined attenuation between said radio heads (see col. 1, line 24 to col. 2, line 53 and abstract of Greene).

Regarding claim 8, Greene discloses a method of handing off communication in a virtual single cell wireless communication network having a plurality of radio heads each having a coverage area and adapted to communicate with mobile terminals in their coverage area,

Art Unit: 2681

comprising: authorizing all of said radio heads to selectively use all frequencies in a spectrum (see explanation in claim 1); determining which of said radio heads will unacceptably interfere with each radio head (see explanation in claim 1); denying use of a selected frequency by one radio head whenever said selected frequency is being used by one of said radio heads which were determined to unacceptably interfere with said one radio head (see col. 1, lines 24-40; col. 2, 31-36). Greene are silent to disclose handing off a mobile terminal communicating on a first frequency with one radio head when said mobile terminal moves to said coverage area of another radio head by performing a soft handoff if none of said radio heads determined to unacceptably interfere with said other radio head are using said first frequency and performing a hard handoff if any one of said radio heads determined to have unacceptable interference with said other radio head is using said first frequency. However, Mimura discloses handing off a mobile terminal communicating on a first frequency with one radio head when said mobile terminal moves to said coverage area of another radio head by performing a soft handoff and a hard handoff (see col. 7, lines 25-40; and col. 9, lines 60-64). ^{It is known} ~~As we know~~ that in a cellular radio system a soft handoff is a handoff of mobile station between a base station to another base station using the same frequency, and hard handoff is a handoff of mobile station between a base station to another base station using a different frequency. It is apparent that a step of denying use of same frequency of Greene combined with the step of determining whether soft handoff or hard handoff for the mobile station of Mimura discloses handing off a mobile terminal communicating on a first frequency with one radio head when said mobile terminal moves to said coverage area of another radio head by performing a soft handoff if none of said radio heads determined to unacceptably interfere with said other radio head are using said first frequency and performing a

Art Unit: 2681

hard handoff if any one of said radio heads determined to have unacceptable interference with said other radio head is using said first frequency. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Mimura to Greene in order to improve signal quality.

Regarding claim 9, a method of Greene in view of Mimura also discloses comprising denying use of a selected frequency by one radio head whenever said selected frequency is being used by one of said radio heads which were determined to unacceptably interfere with said one radio head (see abstract; col. 1, line 25 to col. 2, line 36; and col. 4, lines 55-67; col. 6, lines 8-40 of Greene).

Regarding claim 10, a method of Greene in view of Mimura also discloses comprising determining which of said radio heads have unacceptable interference with said mobile terminal, and performing a hard hand off if any one of said radio heads determined to have unacceptable interference with said other radio head or said mobile terminal is using said first frequency (see explanation in claim 8).

Regarding claim 11, a method of Greene in view of Mimura also discloses wherein said determining which of said radio heads will have unacceptable interference with said mobile terminal comprises continuously measuring said power of said mobile terminal signal at said other radio heads and comparing said measured power to a selected acceptable level (see abstract; col. 1, line 25 to col. 2, line 36; and col. 4, lines 55-67; col. 6, lines 8-40 of Greene).

Art Unit: 2681

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greene, Sr. et al. (US Patent Number 5926763) in view of Mimura (US Patent Number 6587445) and further in view of Rudrapatna et al (US Patent Number 6052598)

Regarding claim 7, a method of Greene in view of Mimura does not mention wherein said measuring attenuation between said radio heads are based on periodic measurements of signals between said radio heads. However, Rudrapatna et al disclose measuring attenuation between said radio heads are based on periodic measurements of signals between said radio heads (see col. 7, lines 32-36 and col. 8, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Rudrapatna et al to Greene in order to determine the time when mobile unit need to handoff for improving signal quality.

4. Claim 12 and 14 are is rejected under 35 U.S.C. 103(a) as being unpatentable over Greene, Sr. et al. (US Patent Number 5926763) in view of Royer et al. (US Patent Number 5710791) and further in view of Mimura (US Patent Number 6587445).

Regarding claims 12 and 14, Greene discloses a virtual single cell wireless communication network for communicating with mobile terminals, comprising: a plurality of spaced radio heads each authorized to use all frequencies in a spectrum (see explanation in claim 1); a processor identifying unacceptable interference between said radio heads and between said radio heads and said mobile terminal (see col. 1, lines 23-41; col. 2, lines 31-36; and abstract); a controller for controlling said frequencies used by said plurality of radio heads whereby a frequency being used by one radio head is denied use to radio heads unacceptably interfering with said one radio head (see col. 2, lines 7-35), and controlling handoff of a mobile terminal

Art Unit: 2681

communicating with a first radio head on a first frequency to change to communicate with a second radio head (see abstract; ; col. 4, lines 54-67; col. 9, lines 25-32); denying use of a selected frequency by one radio head whenever said selected frequency is being used by one of said radio heads which were determined to unacceptably interfere with said one radio head (see col. 1, lines 24-40; col. 2, 31-36).

Greene is silent to disclose a memory storing, for each of said radio heads, an identification of which of said other radio heads unacceptably interfere with said each radio head; controlling handoff by performing a soft handoff if none of said radio heads stored in said memory as unacceptably interfering with said second radio head are using said first frequency, and by performing a hard handoff if any one of said radio heads stored in said memory as unacceptably interfering with said second radio head is using said first frequency.

However, Royer et al disclose a memory storing, for each of said radio heads, an identification of which of said other radio heads unacceptably interfere with said each radio head (see col. 6, lines 9-26).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Royer to Greene in order to determine whether a handoff should be requested or not in order for improving signal quality.

And Mimura discloses handing off a mobile terminal communicating on a first frequency with one radio head when said mobile terminal moves to said coverage area of another radio head by performing a soft handoff and a hard handoff (see col. 7, lines 25-40; and col. 9, lines 60-64). ^{It is known} ~~As we know~~ that in a cellular radio system a soft handoff is a handoff of mobile station between a base station to another base station using the same frequency, and hard handoff is a

Art Unit: 2681

handoff of mobile station between a base station to another base station using a different frequency. It is apparent that denying use of same frequency of Greene combined with determining whether soft handoff or hard handoff for the mobile station of Mimura discloses controlling handoff by performing a soft handoff if none of said radio heads stored in said memory as unacceptably interfering with said second radio head are using said first frequency, and by performing a hard handoff if any one of said radio heads stored in said memory as unacceptably interfering with said second radio head is using said first frequency. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Mimura to Greene in view of Royer in order to improve signal quality.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greene, Sr. et al. (US Patent Number 5926763) in view of Royer et al. (US Patent Number 5710791) and further in view of Mimura (US Patent Number 6587445) and still further in view of Richardson et al. (US Patent Number 5966684).

Regarding claim 13, a virtual single cell wireless communication network for communicating with mobile terminals of Greene in view of Royer and Mimura does not mention wherein said memory further stores periodic samples indicating signal attenuation between said radio heads, and further comprising a processor using samples from said memory to determine which radio heads unacceptably interfere with other radio heads. However, Richardson et al. disclose memory further stores periodic samples indicating signal attenuation between said radio heads, and further comprising a processor using samples from said memory to determine which radio heads unacceptably interfere with other radio heads (see col. 4, lines 13-32).

Art Unit: 2681

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teaching of Richardson et al. to Greene in view of Royer and further in view of Mimura in order to improve signal quality.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Q Nguyen whose telephone number is 703-605-4254. The examiner can normally be reached on 8:30AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erika A Gary can be reached on 703-308-0123. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.


David Nguyen


ERIKA GARY
PATENT EXAMINER